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EXAMINER	
LE, MIRANDA	

ART UNIT	PAPER NUMBER
2167	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/027,195	TUNKELANG, DANIEL	
	Examiner	Art Unit	
	Miranda Le	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to Amendment, filed 04/27/2007.

Claims 1-39 are pending in this application. This action is made Final.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-9, 12, 15-23, 31-34, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent No. 6,853,982 B2), in view of Wen et al. (US Patent No. 7,149,732).

Smith anticipated independent claims 1, 31-33, 38, by the following:

As to claims 1, 33, Smith teaches a computer-implemented method for searching a collection of items, wherein each item in the collection has a set of properties, comprising the steps of: obtaining a query composed of a first set of one or more properties *(i.e. set of ITEM_A,*

ITEM_C ..., which belongs to query, Fig. 3B, col. 18, lines 14-24; col. 18, lines 14-45, col. 20, lines 34-44);

obtaining a result *(i.e. N_{common}, that is the number of sessions in which both ITEM_A and ITEM_B were viewed, col. 19, lines 21-24)* based on applying a distance function *(i.e. pseudocode in Table 2, col. 19)* to the query and an item *(i.e. SESSION_B, Fig. 3B) in the collection (i.e. database 38, Fig. 1)* having a second set of one or more properties *(i.e. the set of ITEM_C, ITEM_D..., which belongs to SESSION_B, Fig. 3B), col. 18, lines 8-67, col. 20, lines 6-33),*

wherein obtaining a result includes determining a third set of properties *(i.e. both ITEM_A and ITEM_B were viewed, col. 19, lines 21-24)* common to the first set of one or more properties and the second set of one or more properties are in common between the query *(Fig. 3B, col. 18, line 58 to col. 19, line 27);*

the distance function determines a distance between the query and an item in the collection based on the number of items in the collection that are associated with all of the properties in the third set of properties *(i.e. ITEM_A and ITEM_B were viewed, col. 19, lines 21-24; col. 19, line 29 to col. 20, line 33).*

providing a representation of the result to a user *(Figs. 11, 12).*

Smith does not specifically teach wherein a higher number of items associated with all of the properties in the third set of properties indicates a greater distance between the query and the item and a lower number of items associated with all of the properties in the third set of properties indicates a smaller distance between the query and the item.

Wen teaches wherein a higher number of items associated with all of the properties in the third set of properties indicates a greater distance between the query and the item and a lower number of items *(i.e. KN(p, q) is the number of common keywords in two queries, col. 5, lines 20-35)* associated with all of the properties in the third set of properties indicates a smaller distance between the query and the item *(See Formula [1], col. 5, lines 20-35).*

It would have been obvious to one of ordinary skill of the art having the teaching of Smith and Wen at the time the invention was made to modify the system of Smith to include the limitations as taught by Wen.

One of ordinary skill in the art would be motivated to make this combination in order to group queries of similar composition in view of Wen (col. 5, lines 1-13), as doing so would give the added benefit of providing procedures to make query similarity determinations, wherein the queries are used in information retrieval operations as taught by Wen (Summary).

As per claim 31, Smith teaches a computer-implemented method for analyzing two sets of properties from a plurality of sets of properties, comprising the steps of: determining a set of properties common to the two sets of properties *(i.e. ITEM_A and ITEM_B were viewed, col. 19, lines 21-24);* determining the number of sets of properties from the plurality of sets of properties that include the set of common properties *(col. 19, lines 8-63);*

assessing the distance between the two sets of properties as a function of the number of sets of properties that include the set of common properties *(i.e. N_{common}, that is the number of sessions in which both ITEM_A and ITEM_B were viewed, col. 19, lines 21-24).*

Smith does not teach wherein a higher number of sets of properties that include the set of common properties indicates a greater distance, and a lower number of sets of properties in the third set of properties that include the set of common properties indicates a smaller distance; and

providing a representation of the distance to a user.

Wen teaches a higher number of sets of properties that include the set of common properties indicates a greater distance, and a lower number of sets of properties *(i.e. KN(p, q) is the number of common keywords in two queries, col. 5, lines 20-35)* in the third set of properties that include the set of common properties indicates a smaller distance *(See Formula [1], col. 5, lines 20-35); and*

providing a representation of the distance to a user *(i.e. Evaluation Results, col. 14, line 24 to col. 15, line 3).*

It would have been obvious to one of ordinary skill of the art having the teaching of Smith and Wen at the time the invention was made to modify the system of Smith to include the limitations as taught by Wen.

One of ordinary skill in the art would be motivated to make this combination in order to group queries of similar composition in view of Wen (col. 5, lines 1-13), as doing so would give the added benefit of providing procedures to make query similarity determinations, wherein the queries are used in information retrieval operations as taught by Wen (Summary).

As per claim 32, Smith teaches a computer-implemented method for analyzing the relationship between two items in a collection of items, wherein each item in the collection is associated with a set of properties, comprising the steps of obtaining a set of properties with

which the two items are commonly associated *(i.e. ITEM_A and ITEM_B were viewed, col. 19, lines 21-24) (col. 18, line 59 to col. 19, line 27);*

determining the degree of commonality between the two items as a function of the number of items in the collection that are associated with all of the properties with which the two items are commonly associated *(i.e. N_{common}, that is the number of sessions in which both ITEM_A and ITEM_B were viewed, col. 19, lines 21-24) (col. 19, line 29 to col. 20, line 33).*

Smith does not specifically teach wherein a higher number of items associated with all of the properties with which the two items are commonly associated indicates a lesser degree of commonality and a lower number of items associated with all of the properties with which the two items are commonly associated indicates a greater degree of commonality; and

providing a representation of the degree of commonality to a user.

Wen teaches a higher number of items associated with all of the properties with which the two items are commonly associated indicates a lesser degree of commonality and a lower number of items associated with all of the properties with which the two items are commonly associated indicates a greater degree of commonality *(i.e. This conceptual distance is determined as follows: the lower the common parent node two documents have, the shorter the conceptual distance between the two documents, col. 7, lines 46-67)*; and

providing a representation of the degree of commonality to a user *(i.e. Evaluation Results, col. 14, line 24 to col. 15, line 3).*

It would have been obvious to one of ordinary skill of the art having the teaching of Smith and Wen at the time the invention was made to modify the system of Smith to include the limitations as taught by Wen.

One of ordinary skill in the art would be motivated to make this combination in order to determine the conceptual distance between documents (col. 7, lines 33-67) in view of Wen, as doing so would give the added benefit of providing procedures to make query similarity determinations, wherein the queries are used in information retrieval operations as taught by Wen (Summary).

As per claim 38, Smith teaches a computer system for managing data records comprising: an information retrieval subsystem that stores and retrieves data records, each data record being associated with a set of properties *(col. 18, lines 15-67);*

a similarity search subsystem that receives similarity search queries and processes similarity search queries based on a distance function *(i.e. pseudocode in Table 2, col. 19),* a similarity search query being associated with a first set of properties *(i.e. set of ITEM_A, ITEM_C ..., which belongs to query, Fig. 3B, col. 18, lines 14-24; col. 18, lines 14-45, col. 20, lines 34-44);*

wherein the distance function determines a distance between the query and a data record in the collection having a second set of properties based on determining a third set of properties common to the first set of properties and the second set of properties, and determining the number of data records in the collection that are associated with all of the properties in the third set of properties *(i.e. ITEM_A and ITEM_B were viewed, col. 19, lines 21-24; col. 19, line 29 to col. 20, line 33).*

Smith does not specifically teach wherein a higher number of data records associated with all of the properties in the third set of properties indicates a greater distance between the

query and the record and a lower number of data records associated with all of the properties in the third set of properties indicates a smaller distance between the query and the record.

Wen teaches wherein a higher number of data records associated with all of the properties in the third set of properties indicates a greater distance between the query and the record and a lower number of data records *(i.e. KN(p, q) is the number of common keywords in two queries, col. 5, lines 20-35)* associated with all of the properties in the third set of properties indicates a smaller distance between the query and the record *(See Formula [1], col. 5, lines 20-35).*

It would have been obvious to one of ordinary skill of the art having the teaching of Smith and Wen at the time the invention was made to modify the system of Smith to include the limitations as taught by Wen.

One of ordinary skill in the art would be motivated to make this combination in order to group queries of similar composition in view of Wen (col. 5, lines 1-13), as doing so would give the added benefit of providing procedures to make query similarity determinations, wherein the queries are used in information retrieval operations as taught by Wen (Summary).

As per claim 2, Smith teaches the step of associating each item in the collection with a set of properties *(col. 19, lines 1-63, see Table 2, col. 19).*

As per claim 3, Smith teaches the step of obtaining a result includes identifying one or more result items whose distance from the query is within a first threshold *(col. 18, lines 46-49, col. 19, lines 53-63).*

As per claim 4, Smith teaches the step of obtaining a result includes ranking the one or more result items according to their distance from the query *(col. 19, lines 53-63, col. 20, lines 21-33).*

As per claim 5, Smith teaches the threshold is defined as a number of result items *(col. 18, lines 35-57, col. 20, lines 6-33).*

As per claim 6, Smith teaches the threshold is defined as a distance *(col. 19, lines 53-63, col. 20, lines 21-33).*

As per claim 7, Smith teaches the step of returning the result *(col. 18, line 28 to col. 19, line 27).*

As per claim 8, Smith teaches the step of obtaining a query includes the step of mapping a received query to a set of one or more properties *(col. 15, lines 9-28, col. 20, line 34 to col. 21, line 33).*

As per claim 9, Smith teaches one or more of the properties are binary *(col. 22, lines 54-67).*

As per claim 12, Smith teaches the properties are grouped into equivalence classes *(i.e. sessions, col. 18, lines 14-45, col. 20, lines 34-44).*

As per claim 15, Smith teaches the query corresponds to a single item *(item_A, item_B, Fig. 3B)* in the collection *(col. 18, lines 14-45, col. 20, lines 34-44).*

As per claim 16, Smith teaches the query corresponds to a plurality of items in the collection *(col. 18, lines 14-45, col. 20, lines 34-44).*

As per claim 17, Smith teaches the query *(item_A, item_B)* is independent of the items in the collection *(popular_A, popular_B, col. 18, lines 14-45, col. 20, lines 34-44).*

As per claim 18, Smith teaches the step of obtaining a result is constrained to a subcollection of the items in the collection *(col. 18, lines 35-45, col. 30, lines 42-64).*

As per claim 19, Smith teaches the subcollection is specified as an expression of properties *(i.e. sessions in which items are viewed, col. 18, lines 14-45, col. 20, lines 34-44).*

As per claim 20, Smith teaches the expression includes a subset of the set of properties that compose the query *(col. 30, lines 42-64).*

As per claim 21, Smith specifically teaches the step of obtaining a query includes identifying certain properties to be ignored in the step of obtaining a result *(col. 18, lines 35-45, col. 26, line 64 to col. 27, line 32, col. 30, lines 5-64).*

As per claim 22, Smith teaches the distance function is applied explicitly *(col. 19, lines 1-63, col. 30, lines 42-52).*

As per claim 23, Smith teaches the distance function is applied implicitly *(col. 19, lines 1-63, col. 30, lines 42-52).*

As per claim 34, Smith teaches the instructions cause the computer to obtain a result by identifying exactly the items whose distance from the query is within a threshold *(col. 20, lines 6-9, col. 19, lines 29-63, Fig. 4).*

4. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent No. 6,853,982 B2), in view of Wen et al. (US Patent No. 7,149,732), and further in view of Fish et al. (US Patent No. 6,035,294).

As per claim 10, Smith, Wen do not specifically teach one or more of the properties are related by a partial order, and wherein, if an item is associated with a property, then the item is also associated with all ancestors of that property in the partial order. Fish teaches this limitation at col. 4, lines 28-64, Figs. 3B-C.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references because Fish's teaching of displaying information relating to the usage with which data values have historically been used with particular parameters in describing specific types of items would have allowed Smith's users to automatically identify items that are related to one another based on the activities of a community of users and to efficiently recommend products to a user based on the searches recently conducted by the user.

As per claim 11, Fish teaches one or more of the properties represent numerical values or ranges, and wherein the partial order reflects a set of containment relationships among the numerical values or ranges (col. 7, line 65 to col. 8, line 2).

5. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent No. 6,853,982 B2), in view of Wen et al. (US Patent No. 7,149,732), and further in view of Tso et al. (US Patent No. 6,385,602 B1).

As per claim 13, Smith, and Wen do not explicitly teach the step of grouping the properties into equivalence classes using clustering. However, Tso teaches this limitation at col. 4, lines 42-55.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references because Tso's suggestion of determining candidate categories, final categories based upon the candidate categories and assigning the matching data items to the final categories are collectively referred to as clustering would have allowed Smith's users to obtain a large number of matching data items in an organized manner.

As per claim 14, Smith teaches each property has a set of subproperties, wherein the clustering is performed such that the distance between two properties in the collection is correlated to the number of properties in the collection that are associated with all of the subproperties common to both properties (col. 15, line 46 to col. 16, line 40).

6. Claims 24-30, 35-37, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US Patent No. 6,853,982 B2), in view of Wen et al. (US Patent No. 7,149,732), and further in view of Kortge et al. (US Patent No. 6,446,068 B1).

As per claim 24, Smith, Wen do not specifically teach the step of obtaining a result includes the step of iterating a random walk process to select potential result items. However, Kortge teaches this limitation at col. 10, lines 49-61, col. 14, lines 46-54.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references because Kortge's teaching the step of obtaining a result includes the step of iterating a random walk process to select potential result items would have allowed Smith's users to find a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

As per claim 25, Smith teaches the step of obtaining a result includes ranking the potential result items by frequency and selecting the potential result items having higher frequencies *(col. 20, lines 6-46, col. 20, lines 64 to col. 21, line 33).*

As per claim 26, Smith teaches the step of obtaining a result includes iterating through one or more subsets of the query and identifying items associated with the one or more subsets *(col. 30, lines 5-34, col. 26, line 64 to col. 27, line 8).*

As per claim 27, Smith teaches the one or more subsets are prioritized according to the number of items in the collection that have all of the properties in each subset and wherein

iterating through one or more subsets of the query is continued until a first threshold is reached *(col. 19, lines 1-63, col. 18, lines 46-58).*

As per claim 28, Smith, Wen do not expressly teach the step of obtaining a result includes applying a Euclidean distance function. However, Kortge teaches this limitation at col. 8, lines 7-12.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references because Kortge's teaching the step of obtaining a result includes applying a Euclidean distance function would have allowed Smith's users to find a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

As per claim 29, Kortge teaches the step of obtaining a result includes merging a first result determined by applying the distance function and a second result determined by applying the Euclidean distance function (col. 8, lines 5-12).

As per claim 30, Kortge teaches the step of obtaining a result includes determining a first result by applying either the distance function or the Euclidean distance function and applying the other distance function to the first result (col. 8, lines 5-12).

As per claim 35, Smith, Wen do not expressly teach the instructions cause the computer to obtain a result by identifying approximately the items whose distance from the query is within

a threshold according to a heuristic. However, Kortge teaches this limitation at col. 6, lines 27-46.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references because Kortge's teaching the step of the instructions cause the computer to obtain a result by identifying approximately the items whose distance from the query is within a threshold according to a heuristic would have allowed Smith's users to find a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

As per claim 36, Kortge teaches the heuristic permits a trade-off between the accuracy and the performance of a search (col. 6, lines 27-46).

As per claim 37, Kortge teaches the heuristic includes the use of a random walk process (col. 10, lines 49-61, col. 14, lines 46-54).

As per claim 39, Smith, Wen do not specifically teach a clustering subsystem that employs the distance function of the similarity search subsystem to construct a graph. However, Kortge teaches this limitation at col. 9, lines 10-45, Fig. 5.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references because Kortge's teaching the step of a clustering subsystem that employs the distance function of the similarity search subsystem to construct a graph would have

allowed Smith's users to find a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

Response to Arguments

7. Applicant's arguments regarding with respect to claims 1-39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham, can be reached on (571) 272-7079. The fax number to this Art Unit is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Miranda Le
July 20, 2007

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